REMARKS

Applicants have amended the claims to more particularly define the invention in view of the outstanding Official Action. Claim 1 has been amended so that an alumina layer and a top electrode have been amended to have specific limitations of how to be formed as this is an integral part of the claimed subject matter and should not be ignored in analyzing the claimed subject matter representing the invention as a whole. The amendments of claim 1 are supported by page 7, lines 13~25 and page 9, lines 30~34 of the specification. Claim 6 has been amended so that an anode insulating layer and a top electrode have become to have specific limitations of how to be formed. The amendments of claim 6 are supported by page 10, line 33~page 11, line 2, page 11, lines 23~27 and page 9, lines 30~34 of the specification. Claim 35 has been amended to correct an obvious typographical error. Accordingly, no new matter has been added.

Applicants most respectfully submit that all of the claims now present in the application are in full compliance with 35 USC 112 and are clearly patentable over the references of record.

The rejection to claims 1-39 under 35 USC 102(b) as being anticipated by Cho has been carefully considered but is most respectfully traversed in view of the following comments. This is the only prior art rejection and there is no rejection on the grounds of obviousness.

Applicants wish to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim.

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the

> claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

In this regard, with respect to Claim 1, an electric field emission device of claim 1 includes a supporting substrate, a bottom electrode layer, a gate insulating layer, a gate electrode layer, an alumina layer, a top electrode layer and emitters, and restricts the layers to be formed in the above stated order.

The Office Action asserts that the alumina layer of claim 1 corresponds to an anode oxidation layer 15, which is made from an aluminum foil 14. Referring to Figs. 3b~3d and the corresponding recitations of the specification of Cho, the anode oxidation layer 15 is formed on an insulating layer 12 and thereafter **removed** after etching the insulating layer 12 and before forming an upper electrode 27.

Comparing to that, claim 1 of the present application restricts that the alumina layer is formed on the gate electrode layer and under the top electrode layer, considering that the top electrode layer is formed on the alumina layer. Since the alumina layer is **not removed** until the top electrode layer is formed, the anode oxidation layer 15 of Cho does not correspond to the alumina layer of claim 1. Accordingly, the anode oxidation layers 15 disclosed in Figs. 3b and 3c of Cho fails to disclose the alumina layer of claim 1.

Although it is tried to compare a spacer 20 of Fig. 8 of Cho to the alumina layer of claim 1, the conclusion is the same, that is, Cho fails to disclose all the limitations of claim 1.

The specification of Cho only recites that the spacer for enduring the vacuum stress is formed when the upper plate 27 is formed, but does not mention a material, specific forming manner or the like of the spacer 20. Contrary to this, claim 1 specifically limits the features of the alumina layer, that is, the alumina layer is formed by the anodic oxidation process. Additionally, the terms of "the alumina layer" itself directly means it is made from aluminum.

Furthermore, it needs to be noted that the spacer 20 is conventionally made of SiO_2 and the thickness thereof ranges from 100 μm to 300 μm, which is much thicker than that of conventional alumina layer formed by the anodic oxidation process. And

there is a disadvantage that the thick spacer results in hindering low voltage emission and high efficient emission, while the structure of claim 1 is for the low voltage emission and high efficient emission.

Consequently, the spacer 20 disclosed in Fig. 8 of Cho fails to disclose the alumina layer of claim 1.

Additionally, claim 1 also specifically recites how to form the top electrode layer such as electron beam deposition, thermal deposition or the like, which may be used for angled deposition to thereby form the top electrode layer easily in a high vacuum atmosphere without additional devices or processes. However, Cho does not disclose a particular method for forming the upper plate 27, and it conventionally needs an additional process of making vacuum a space between an emitter and the upper plate 27 and needs additional devices therefor. Consequently, Cho fails to disclose the top electrode layer recited in claim 1.

As asserted above, claim 1 of the present application has new limitations relating to the alumina layer and the top electrode layer over Cho, and therefore, the rejections of claim 1 and claims 2~5 depending thereon should be withdrawn.

With respect to claim 6, the amended claim 6 recites that an anode insulating layer is formed on the gate electrode layer and under the top electrode layer, and specifically restricts how to form the anode insulating layer. For the reasons about the anode oxidation layer 15 and the spacer 20 of Cho as stated above, particularly, for the reason that Cho does not specifically disclose how to form the spacer 20, it is respectfully submitted that the restricted anode insulating layer of claim 6 is not disclosed by the spacer 20 of Cho.

Further, for the same reason about the upper plate 27 as stated above, the restricted top electrode layer in the amended claim 6 is considered novel over Cho.

Consequently, it is believed that Cho fails to disclose all the limitations of claim 6, and therefore the rejections of claim 6 and claims 7~10 depending thereon are groundless to be withdrawn.

With respect to claim 11, the present invention of claim 11 forms an alumina layer on a gate electrode layer by performing an anodic oxidation process, and then,

forms a top electrode layer on the alumina layer. It needs to be noted that claim 11 does not remove the alumina layer.

On the other hand, the processes shown in Figs. 3a~3d of Cho remove the anode oxidation layer 15, which may correspond to the alumina layer of claim 11. Further, the processes illustrated in Figs. 4c~4g also remove the anode oxidation layer 15 and each of devices drawn in Figs. 5a~5c and 7 does not have the anode oxidation layer 15. Fig. 8 shows a triode type field emission device as a complete product and there is no anode oxidation layer 15.

Consequently, Cho shows various fabrication methods of the field emission device, however, they commonly adopt removing the anode oxidation layer 15 before forming the upper plate 27 to complete the device. Being compared to this, considering that claim 11 of the present invention does not remove the alumina layer and that the performance of the field emission device is substantially affected by whether the spacer is needed or not, which depends on removing the alumina layer or not, it cannot be admitted that Cho discloses all the steps of claim 11 of the present application.

Accordingly, the rejection of claim 11 is considered groundless, and it is respectfully requested that the rejections of claim 11 and claims 12~25 depending thereon be withdrawn.

With respect to claim 26, comparing Figs. 3d, 4g, 5a~5c or 7 to Fig. 8, it can be known that the spacer 20 is formed on a gate electrode 13 after removing the anode oxidation layer 15 having been on the gate electrode 13, and then, the upper plate 27 is formed on the spacer 20.

Contrary to this, the present invention of claim 26 forms the anode insulating layer under the aluminum layer which would be transformed into the alumina layer. This means that the anode insulating layer is formed earlier than and under the alumina layer.

Although the anode insulating layer may be compared to the spacer 27 for the reason that what is placed underneath the top electrode layer is the anode insulating layer, Cho cannot be considered to disclose all the steps of claim 26. That is because the method of claim 26 has the sequentially performed steps of **forming the anode**

insulating layer, forming the alumina layer thereon, **removing the alumina layer** and forming the top electrode layer on the anode insulating layer, while Cho discloses sequentially performed steps of forming an anode oxidation layer 15, **removing the anode oxidation layer 15, forming the spacer 20** and forming the upper plate 27. Namely, the invention disclosed by Cho is different from that of claim 26 in the performed order.

Consequently, the rejection of claim 26 is considered groundless, and therefore it is respectfully requested that the rejections of claim 26 and claims 27~39 depending thereon be withdrawn.

As stated above, all the rejections of the present application is found groundless, and therefore, it is submitted that all the claims are considered allowable.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all the claims now present in the application are most respectfully requested.

Respectfully submitted,
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